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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/576,547

03/28/2007

Jurgen Frosien

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EXAMINER

CHANG, HANWAY

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/576,547	Applicant(s) FROSIEN ET AL.	
	Examiner Hanway Chang	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/20/2006, 03/30/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in European Patent Office on 10/20/2003. It is noted, however, that applicant has not filed a certified copy of the EPO 03023826.5 application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanami et al. (US Pat. 5,065,034, hereinafter Kawanami) in view of Lischke (US Pat. 4,899,060, hereinafter Lischke).

Regarding claim 1, Figs. 4-5 of Kawanami discloses a charged particle beam device comprising a charged particle beam source (1) to generate a charged particle beam (2) (see col. 3, lines 25-37); a focusing lens (3b) to focus the charged particle beam (2) onto the specimen (6) (see col. 3, lines 25-37); and an aperture system (11a-b) for defining an aperture (13) for the charged particle beam (2) (see col. 3, lines 53-63), the aperture system (11a-b) comprising a first member (11a) to block a first portion of the charged particle beam (2) between the charged particle beam source (1) and the

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focusing lens (3b) (see col. 3, lines 53-61); a second member (11b) to block a second portion of the charged particle beam (2) between the charged particle beam source (1) and the focusing lens (3b) (see col. 3, lines 53-61); first means for moving (12a) the first member (11a) to adjust a size of a blocked first portion of the charged particle beam (2) (see col. 3, lines 53-61). Kawanami does not disclose a second means for moving the second member independently of the first member. However, in the same field of endeavor, Fig. 3a of Lischke discloses a means for moving (SE) a second member independently of the first member (see col. 4, lines 35-60). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having a means for moving (SE) for each member for the purpose of having greater control over the shape of the aperture for the charged particle beam.

Regarding claim 2, Fig. 5 of Kawanami discloses the first member (11a) and the second member (11b) have a respective first edge and a second edge capable of defining a respective first boundary and a second boundary of the aperture (13) (see fig. 5).

Regarding claim 3, Fig. 5 of Kawanami discloses the first edge is shaped to provide a first boundary which extends essentially linearly (see fig. 5).

Regarding claim 4, Fig. 5 of Kawanami discloses the first edge and second edge are shaped to provide a first boundary and a second boundary which extend essentially in parallel (see fig. 5). It should be noted that the first and second boundary extend essentially in parallel through the aperture (13) down the beam path.

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Regarding claim 5, Fig. 5 of Kawanami discloses the first edge is shaped to provide an angled first boundary (see fig. 5). It should be noted that a perpendicular corner is an angle.

Regarding claim 6, Fig. 5 of Kawanami discloses the first means for moving (12a) the respective first member (11a) is capable of moving the respective first edge without changing the shape of the aperture (13) (see col. 3, lines 38-51). It should be noted that the aperture slit is substantially the same shape along the slit. Therefore, when the first member (11a) moves the distance along the slit, the size of the slit does not change shape, thereby not changing the shape of the aperture (13).

Regarding claim 7, Fig. 5 of Kawanami discloses the first means for moving (12a) the respective first member (11a) includes a respective first motor (18) (see col. 4, lines 23-47).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanami in view of Lischke and in further view of Wollnik (US Pat. 3,610,734, hereinafter Wollnik).

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Regarding claim 8, a difference between Kawanami and the claimed invention is a third, a fourth, a fifth, a sixth, a seventh or an eighth member to selectively block respective third, fourth, fifth, sixth, seventh or eighth portions of the charged particle beam (2) between the charged particle beam source (1) and the focusing lens (3b). However, in the same field of endeavor, Fig. 5 of Wollnik discloses seven members (52-59) to selectively block seven portions of the charged particle beam (see col. 4, lines 26-38). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having multiple plates overlap arranged to form a wanted shape for the purpose of having greater control over the shape of the charged particle beam. Furthermore, it would have been obvious at the time of invention to a person of ordinary skill in the art to use multiple members, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Regarding claim 9, Kawanami does not explicitly disclose a third, a fourth, a fifth, a sixth, a seventh or an eighth means for moving the respective third, fourth, fifth, sixth, seventh or eighth members to adjust the sizes of the blocked respective third, fourth, fifth, sixth, seventh or eighth portions of the charged particle beam independently. However, in the same field of endeavor, Fig. 3a of Lischke discloses a means for moving (SE) a second member independently of the first member (see col. 4, lines 35-60). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having a means

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for moving (SE) for each member for the purpose of having greater control over the shape of the aperture for the charged particle beam. Furthermore, it would have been obvious at the time of invention to a person of ordinary skill in the art to have multiple members to independently move according to the other members, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

Regarding claim 10, a difference between Kawanami and the claimed invention is a third, a fourth, a fifth, a sixth, a seventh or an eighth member to selectively block respective third, fourth, fifth, sixth, seventh or eighth member have a respective third, fourth, fifth, sixth, seventh or eighth edges capable of defining respective third, fourth, fifth, sixth, seventh or eighth boundaries of the aperture. However, in the same field of endeavor, Fig. 5 of Wollnik discloses seven members (52-59) that have respective seven edges capable of defining respective seven boundaries of the aperture (see col. 4, lines 27-38)). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having multiple plates overlap arranged to form a wanted shape for the purpose of having greater control over the shape of the charged particle beam. Furthermore, it would have been obvious at the time of invention to a person of ordinary skill in the art to use multiple members, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

Regarding claim 11, a difference between Kawanami and the claimed invention is a third, a fourth, a fifth, a sixth, a seventh or an eighth edge is shaped to provide a

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respective third, fourth, fifth, sixth, seventh or eighth boundary which extends essentially linearly. However, in the same field of endeavor, Fig. 5 of Wollnik discloses seven members (52-59) which have seven edges shaped to provide a respective third, fourth, fifth, sixth, seventh or eighth boundary which extends essentially linearly (see fig. 5). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having multiple plates overlap arranged to form a wanted shape for the purpose of having greater control over the shape of the charged particle beam. Furthermore, it would have been obvious at the time of invention to a person of ordinary skill in the art to use multiple members, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

Regarding claim 12, Fig. 5 of Kawanami does not explicitly disclose a third, a fourth, a fifth, a sixth, a seventh or an eighth means for moving the respective third, fourth, fifth, sixth, seventh or eighth member, each capable of moving the respective third, fourth, fifth, sixth, seventh or eighth edges without changing the shape of the aperture. However, Fig. 5 of Kawanami discloses the first means for moving (12a) the respective first member (11a) is capable of moving the respective first edge without changing the shape of the aperture (13) (see col. 3, lines 38-51). It should be noted that the aperture slit is substantially the same shape along the slit. Therefore, when the first member (11a) moves the distance along the slit, the size of the slit does not change shape, thereby not changing the shape of the aperture (13). Therefore, it would have been obvious to the ordinary artisan at the time the invention was made to have multiple

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plates overlap arranged to form a wanted shape with the aperture slit as shown in Fig. 5 of Kawanami for the purpose of having greater control over the shape of the charged particle beam. Having such a set up would thereby have the members be capable of moving the edges without changing the shape of the aperture. Furthermore, it would have been obvious at the time of invention to a person of ordinary skill in the art to use multiple members, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

Regarding claim 13, Kawanami does not explicitly disclose a third, a fourth, a fifth, a sixth, a seventh or an eighth edge pair-wise extend essentially in parallel with a tolerance of less than 10 degrees. However, it would have been obvious at the time of invention to a person of ordinary skill in the art to use multiple members to shape the charged particle beam to the wanted shape, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Kawanami by grouping the edges pair-wise with a tolerance of less than 10 degrees, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 14, Kawanami discloses the first and second means for moving the respective first and second members are capable of moving the respective member with steps having a step size smaller than 10 μm (see col. 4, lines 48-60).

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Regarding claim 15, Fig. 5 of Kawanami discloses the first means for moving (12a) the respective first member (11a) includes a respective first motor (18) (see col. 4, lines 23-47).

Regarding claim 16, Fig. 4 of Kawanami discloses the device includes a scanning unit (3a and 3b) to scan the charged particle beam across the specimen (6) (see col. 3, lines 23-30).

Regarding claim 17, Fig. 4 of Kawanami discloses the charged particle beam device is a focusing ion beam device (see col. 3, lines 23-25).

Claims 18-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanami in view of Lischke and in further view of Szilagyi (US Pat. 4,963,748, hereinafter Szilagyi).

Regarding claim 18, a difference between Kawanami and the claimed invention is the device further comprising an octupole component. However, in the same field of endeavor, Fig. 1 of Szilagyi discloses an octupole component (13) (see col. 4, lines 34-56). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having an octupole for the purpose of having control of the movement of the charged particle beam.

Regarding claim 19, a difference between Kawanami and the claimed invention is the device further comprising a hexapole component to shape the charged particle beam. However, in the same field of endeavor, Fig. 1 of Szilagyi discloses an octupole

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component (13) (see col. 4, lines 34-56). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having an octupole for the purpose of having control of the movement of the charged particle beam. Furthermore, it is well known in the art by one of ordinary skill at the time of invention that quadrupoles, hexapoles, octupoles, decapoles, and higher can all be used interchangeably for the purpose of having greater control over the movement of the beam (increasing the number of poles) or being easier and cheaper to maintain and calibrate (decreasing the number of poles).

Regarding claim 21, Figs. 4-5 of Kawanami discloses a charged particle beam device comprising a charged particle beam source (1) to generate a charged particle beam (2) (see col. 3, lines 25-37); a focusing lens (3b) to focus the charged particle beam (2) onto the specimen (6) (see col. 3, lines 25-37); and an aperture system (11a-b) for defining an aperture (13) for the charged particle beam (2) (see col. 3, lines 53-63), the aperture system (11a-b) comprising a first member (11a) to block a first portion of the charged particle beam (2) between the charged particle beam source (1) and the focusing lens (3b) (see col. 3, lines 53-61); a second member (11b) to block a second portion of the charged particle beam (2) between the charged particle beam source (1) and the focusing lens (3b) (see col. 3, lines 53-61); first means for moving (12a) the first member (11a) to adjust a size of a blocked first portion of the charged particle beam (2) (see col. 3, lines 53-61). Kawanami does not disclose a second means for moving the second member independently of the first member. However, in the same field of endeavor, Fig. 3a of Lischke discloses a means for moving (SE) a second member

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independently of the first member (see col. 4, lines 35-60). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having a means for moving (SE) for each member for the purpose of having greater control over the shape of the aperture for the charged particle beam.

Furthermore regarding claim 21, Kawanami does not explicitly disclose passing the charged particle beam through an octupole field. However, in the same field of endeavor, Fig. 1 of Szilagyi discloses an octupole component (13) (see col. 4, lines 34-56). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having an octupole for the purpose of having control of the movement of the charged particle beam. It should be noted that in this combination, the charged particle beam (2) inherently passes through a rectangular shaped aperture (13).

Claims 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanami in view of Lischke and in further view of Wollnik as applied to claim 8 above, and further in view of Nakasugi (US PGPub. 2004/0149935, hereinafter Nakasugi).

Regarding claim 20, a difference between Kawanami and the claimed invention is the device having a first, second, and third members oriented to define a triangular aperture for the charged particle beam. However, in the same field of endeavor, Fig. 1b and 5b of Nakasugi discloses a first (2), second (3), and third (B3) members oriented to

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define a triangular aperture (see Fig. 5b) for the charged particle beam (see paragraph [0087]). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having a third member for the purpose of shaping the aperture for the charged particle beam into any required shape, such as a triangular shaped aperture, as taught by Nakasugi.

Regarding claim 22, Figs. 4-5 of Kawanami discloses a charged particle beam device comprising a charged particle beam source (1) to generate a charged particle beam (2) (see col. 3, lines 25-37); a focusing lens (3b) to focus the charged particle beam (2) onto the specimen (6) (see col. 3, lines 25-37); and an aperture system (11a-b) for defining an aperture (13) for the charged particle beam (2) (see col. 3, lines 53-63), the aperture system (11a-b) comprising a first member (11a) to block a first portion of the charged particle beam (2) between the charged particle beam source (1) and the focusing lens (3b) (see col. 3, lines 53-61); a second member (11b) to block a second portion of the charged particle beam (2) between the charged particle beam source (1) and the focusing lens (3b) (see col. 3, lines 53-61); first means for moving (12a) the first member (11a) to adjust a size of a blocked first portion of the charged particle beam (2) (see col. 3, lines 53-61). Kawanami does not disclose a second means for moving the second member independently of the first member. However, in the same field of endeavor, Fig. 3a of Lischke discloses a means for moving (SE) a second member independently of the first member (see col. 4, lines 35-60). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having a means for moving (SE) for each member

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for the purpose of having greater control over the shape of the aperture for the charged particle beam.

Further regarding claim 22, Kawanami does not disclose the aperture is triangular. However, in the same field of endeavor, Fig. 1b and 5b of Nakasugi discloses a first (2), second (3), and third (B3) members oriented to define a triangular aperture (see Fig. 5b) for the charged particle beam (see paragraph [0087]). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having a third member for the purpose of shaping the aperture for the charged particle beam into any required shape, such as a triangular shaped aperture, as taught by Nakasugi.

Further regarding claim 22, Kawanami does not explicitly disclose passing the charged particle beam through a hexapole field. However, in the same field of endeavor, Fig. 1 of Szilagyi discloses an octupole component (13) (see col. 4, lines 34-56). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Kawanami by having an octupole for the purpose of having control of the movement of the charged particle beam. Furthermore, it is well known in the art by one of ordinary skill at the time of invention that quadrupoles, hexapoles, octupoles, decapoles, and higher can all be used interchangeably for the purpose of having greater control over the movement of the beam (increasing the number of poles) or being easier and cheaper to maintain and calibrate (decreasing the number of poles). It should be noted that in this combination,

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the charged particle beam (2) inherently passes through a triangular shaped aperture (13).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-22 of copending Application No. 11/923,438, hereinafter ‘438. Although the conflicting claims are not identical, they are not patentably distinct from each other because in co-pending application ‘438, claim 1 contains all the limitation of claims 1, 21, and 22 of the instant application except for the a second means for moving the second member independently of the first member. However, this limitation has been proven obvious

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(see above rejections). It should be noted that the dependent claims are merely obvious variants.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanway Chang whose telephone number is (571)270-5766. The examiner can normally be reached on Monday to Friday 7:30 AM till 4 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Hanway Chang

June 16, 2009

/H. C./

Examiner, Art Unit 2881

/ROBERT KIM/

Supervisory Patent Examiner, Art Unit 2881